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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/385,822	08/30/1999	MARKUS SZYMANIAK	35671/DBP/E4	9691

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EXAMINER

YANG, RYAN R

ART UNIT	PAPER NUMBER
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2672

DATE MAILED: 01/29/2004

18

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/385,822

Applicant(s)

SZYMANIAK, MARKUS

Examiner

Ryan R Yang

Art Unit

2672

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-15 is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is responsive to communications: Amendment, filed on 11/14/2004.
This action is non-final.
2. Claims 1-15 are pending in this application. Claims 1 and 13-15 are independent claim.
3. This application claims foreign priority dated 8/30/98.
4. The present title of the invention is "Method and Apparatus for Eliminating Unwanted Steps at Edges in Graphics Representations in the Line Raster" as filed originally.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
6. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doll (6,226,400) and further in view of Shiraishi (5,903,276).

As per claim 1, Doll discloses a method of eliminating unwanted steps at edges in image representations in the line raster, in particular in on-line operation, characterised by the steps:

a) application of an edge operator to a rastered image portion for coarsely ascertaining at least one rastered edge configuration in the rastered image portion (Figure 2),

b) determining the position of at least a first pixel from the amount of those pixels which form the rastered edge configuration or adjoin said rastered edge configuration ("The string sequencer 30 then uses the pixel location 32 of the current target pixel, the surface string IDs 24, and the surface string slopes 28 to generate string sequences 34 which define the color borders of the raster image", column 14, line 3-7),

c) approximation of a straight line for ascertaining a probable configuration of the unrastered image edge in the proximity of the first pixel ("A string sequence 34 comprises a sequence of connected surface string IDs 24 in an order that follows the contour of the color border", column 14, line 7-9).

Doll discloses a method of defining a border of a raster image. It is noted that Doll does not explicitly disclose "d) ascertaining a criterion from the approximation straight line and the position of the first pixel for mixing a color X to the color C in the first pixel considered (Figure 38 establishes the criterion to mixing the color, column 20, line 62- column 22, line 24), and e) mixing the ascertained color X to the color C in the first pixel considered (Figure 49, where a dot is considered a pixel, column 49, line 10-14)", however, this is known in the art as taught by Shiraishi. Shiraishi discloses a method of smoothing an image edge in which d) ascertaining a criterion from the approximation straight line and the position of the first pixel for mixing a color X to the color C in the first pixel considered (Figure 38 establishes the criterion to mixing the color, column 20, line 62- column 22, line 24), and e) mixing the ascertained color X to the color C in the first pixel considered (Figure 49, where a dot is considered a pixel, column 49, line 10-14) is performed.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

7. As per claim 2, Doll and Shiraishi demonstrated all the elements as applied to the rejected claim 1, *supra*, and Shiraishi further discloses that the criterion of method step d), in dependence on the position of the pixel being considered relative to the approximation straight line, establishes which color X is mixed to the color C of the pixel being considered (Figure 49 and column 23, line 10-14).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

8. As per claim 3, Doll and Shiraishi demonstrated all the elements as applied to the rejected claim 2, *supra*, and Shiraishi further discloses that the criterion in accordance with method step d), in dependence on the position of the pixel being considered relative to the approximation straight line, establishes that the color of at least one adjacent pixel is mixed in weighted mode to the color of the pixel being considered (Figure 38 219, 220, 223, 224, 227, and 228; "The multiplier 219 multiplies the color information R of the selected dot by the area size of the exterior region to obtain a weight of the exterior-region color in the current dot", column 21, line 13-20).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

9. As per claim 4, Doll and Shiraishi demonstrated all the elements as applied to the rejected claim 1, *supra*, and further discloses that in the case of a pixel being considered which is not intersected by the approximation straight line, the color remains unchanged (Figure 39A-46E show the color of non-intersecting pixels are unchanged).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

10. As per claim 5, Doll and Shiraishi demonstrated all the elements as applied to the rejected claim 1, *supra*, and Shiraishi further discloses that in the case of a pixel being considered which is intersected by the approximation straight line the resultant color R is determined in accordance with the following criterion:

the approximation straight line divides the pixel being considered into two surface portions F_1 , F_2 , wherein $F_1 + F_2 = 1$, with 1 being the total area of the pixel, wherein F_1 is that surface portion in which the pixel center point lies (Figure 49, where the total area size is 1);

mixed to color C of the pixel being considered is the color X of that adjacent pixel which adjoins the longest edge, formed by the raster, of the surface portion F_2 (Figure 49, see the equation to obtain the color).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

11. As per claim 6, Doll and Shiraishi demonstrated all the elements as applied to the rejected claim 5, supra, and Shiraishi further discloses that the resultant color R arises out of the original color C of the pixel being considered and the mixed color X of an adjacent pixel in accordance with the following equation:

$$R = F_1 \times C + F_2 \times X \text{ (Figure 49, see the equation to obtain the color).}$$

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

12. As per claim 7, Doll and Shiraishi demonstrated all the elements as applied to the rejected claim 5, supra, and Shiraishi further discloses that the surface portions F_1 , F_2 are approximated by a suitable approximation process (Figure 38, column 20, line 62-column 22, line 17).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll

discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

13. As per claim 8, Doll and Shiraishi demonstrated all the elements as applied to the rejected claim 1, supra, and Shiraishi further discloses that said method steps are applied to an image portion treated by means of rendering and/or a shading process (see Abstract, since the image generating process includes rendering and shading).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

14. As per claim 9, Doll and Shiraishi demonstrated all the elements as applied to the rejected claim 8, supra, and Shiraishi further discloses the shading/rendering is triangle- or scanline-based, or that it involves Gouraud or Phong shading (Figure 70A and 70B show the process is scanline-based).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

15. As per claim 10, Doll and Shiraishi demonstrated all the elements as applied to the rejected claims, supra, and since the processes are not carried out simultaneously they are carried out in time-displaced relationship.

16. As per claim 11, Doll and Shiraishi demonstrated all the elements as applied to the rejected claim 10, supra, and since Figure 70A and 70B of Shiraishi depict the subroutine per scan line, the time displaced is per image line.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

17. As per claim 12, Doll and Shiraishi demonstrated all the elements as applied to the rejected claim 1, supra, and Shiraishi further discloses the processing is effected in time-displaced relationship in a frame buffer without further intermediate storage (Figure 15).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shiraishi into Doll because Doll discloses a method of defining a border of a raster image and Shiraishi discloses the color along the image border can be mixed in order to generate a smooth edge.

Allowable Subject Matter

18. Claims 13-15 are allowed.

Response to Arguments

19. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Ryan Yang** whose telephone number is **(703) 308-6133**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Michael Razavi**, can be reached at **(703) 305-4713**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231


or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 305-47000377.

Ryan Yang
January 16, 2004



MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600